WHAT IS CLAIMED IS:

1. A method of preparing an edible protein composition with reduced oxidation protential from animal muscle, the method comprising:

(a) obtaining a mixture comprising minced or ground animal muscle;

(b) adding an amount of a polyvalent, food-grade cation to the mixture sufficient to separate cellular membranes from cytoskeletal proteins in the animal muscle; and

(c) treating the mixture to reduce the oxidation potential of the separated cellular membranes.

2. The method of claim 1, wherein the polyvalent, food-grade cations are calcium or magnesium ions, and wherein the concentration of calcium or magnesium ions in the mixture is in a range of about 0.1 mM to about 50 mM after the addition.

3. The method of claim 1, wherein step (c) comprises aggregating at least a portion of the separated cellular membranes in the mixture to reduce the total separated membrane surface area, thereby reducing the oxidation potential.

4. The method of claim 3, further comprising (d) dewatering the mixture.

5. The method of claim 1, wherein step (c) comprises removing the separated cell membranes from the mixture, thereby reducing the oxidation potential.

6. The method of claim 1, wherein step (c) comprises incubating the mixture to allow the separated membranes to aggregate, thereby reducing the oxidation potential, and wherein the method further comprises (d) adjusting the pH of the mixture to solubilize at least a portion of the protein in the mixture.

7. The method of claim 6, further comprising (e) removing the aggregated separated cell membranes from the solubilized protein.

8. The method of claim 7, further comprising (f) collecting the solubilized protein.

9. The method of claim 3, wherein step (c) comprises adding an acid to the mixture.

10. The method of claim 6, wherein step (d) comprises adding an acid to the mixture.

11. The method of claim 9, wherein sufficient acid is added to the mixture to lower the pH to below about 3.5.

12. The method of claim 6, wherein step (d) comprises adding a base to the mixture.

13. The method of claim 12, wherein sufficient acid is added to the mixture to raise the pH to greater than about 10.0.

14. The method of claim 1, wherein the polyvalent food-grade cation is calcium chloride.

15. The method of claim 1, wherein the polyvalent food-grade cation is magnesium chloride.

16. The method of claim 1, wherein step (c) comprises incubating the mixture for up to 60 minutes following step (b).

17. The method of claim 1, further comprising adding an organic acid to the mixture before, during, or after step (b).

18. The method of claim 17, wherein the organic acid is selected from the group consisting of citric, malic, maleic, fumaric, and tartaric acid.

19. The method of claim 7, wherein step (e) is performed by centrifugation.

20. The method of claim 19, wherein the centrifugation is performed at from about 500 x g to about 10,000 x g.

21. The method of claim 7, wherein step (e) is performed by precipitation.

22. The method of claim 3, wherein aggregating is performed by adding to the mixture an aggregant selected from the group consisting of carrageenan, algin, demethylated pectin, gum arabic, chitosan, polyethyleneimine, spermine, spermidine, calcium salt, magnesium salt, sulfate, phosphate, and polyamine.

23. The method of claim 6, wherein step (c) further comprises adding to the mixture an aggregant selected from the group consisting of carrageenan, algin, demethylated pectin, gum arabic, chitosan, polyethyleneimine, spermine, spermidine, calcium salt, magnesium salt, sulfate, phosphate, and polyamine.

24. The method of claim 4, wherein dewatering is performed by centrifuging the mixture.

25. The method of claim 4, wherein dewatering is performed by filtering the mixture.

26. The method of claim 4, wherein dewatering is performed by pressing the mixture.

27. The method of claim 1, further comprising homogenizing the animal muscle between steps (a) and (b).

28. The method of claim 1, wherein step (b) and (c) are performed simultaneously by adding a sufficient amount of calcium or magnesium ions to cause

both separation of cellular membranes and cytoskeletal proteins and aggregation of the membranes.

29. An edible protein composition with reduced oxidation potential comprising minced or ground animal muscle, wherein the composition comprises a cellular membrane content of less than 40% of a cellular membrane content in a sample of the animal muscle as removed from the animal prior to mincing or grinding.

30. The edible protein composition of claim 29, wherein the protein composition has a cellular membrane content less than 25% of that in the animal muscle.

31. The edible protein composition of claim 29, wherein the protein composition has a cellular membrane content less than 20% of that in the animal muscle.

32. The edible protein composition of claim 29, wherein the protein composition has a cellular membrane content less than 10% of that in the animal muscle.

33. The edible protein composition of claim 29, wherein the protein composition has a cellular membrane content less than 5% of that in the animal muscle.

34. An edible protein composition with reduced oxidation potential comprising minced or ground animal muscle, wherein the composition comprises a cellular membrane content approximately equal to the cellular membrane content in a sample of the animal muscle as removed from the animal prior to mincing or grinding, wherein at least 60% of the cellular membranes in the edible protein

composition are separated from cytoskeletal proteins and are in aggregated form, as determined using microscopy.

35. An edible protein composition with reduced oxidation potential produced by the process of claim 1.